

Liquid Interface Diffusion Bonding of FPS Heat Pipes to Core, Phase I

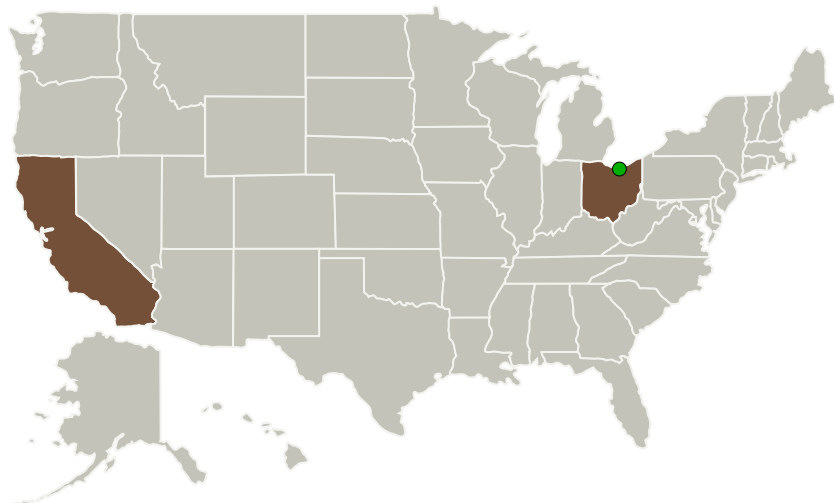


Completed Technology Project (2016 - 2016)

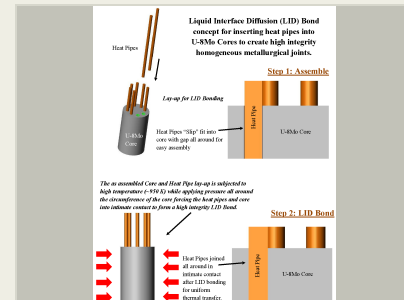
Project Introduction

Peregrine proposes the development of 'Liquid Interface Diffusion' (LID) bonding to be the joining method to provide a homogeneous connection between the heat pipes and cores of Fission Power Systems (FPS). This innovation will create a high strength, high temperature and high integrity (homogeneous) joint between the Hanes 230 alloy comprising the NaK heat pipe wall and U-8Mo core. This homogeneous joint will allow for high efficiency heat transfer from the core to NaK heat pipes with no voids or separations that can act as thermal shunts that will become hot spots/cold spots at the heat exchanging surface that could lead to dead spots, or potential sites for thermal runaway. The creation of a high efficiency joint allows both the core and the heat pipe to both operate at their optimum performance supplying a maximum and balanced thermal load to the hot side of the sterling engines making up the operating component generating electricity within the Fission Power System.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
The Peregrine Falcon Corporation	Lead Organization	Industry	Pleasanton, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio



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Primary U.S. Work Locations

California

Ohio

Project Transitions

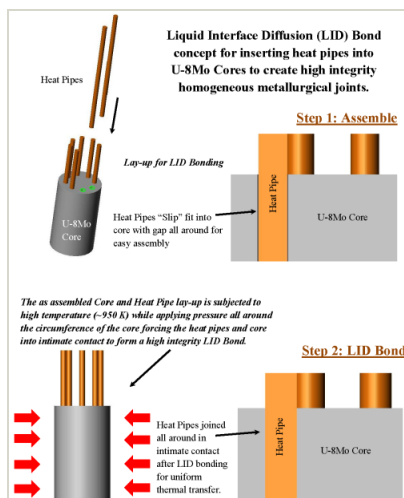
June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

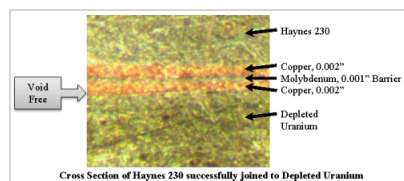
- Final Summary Chart(<https://techport.nasa.gov/file/139858>)

Images



Briefing Chart Image

Liquid Interface Diffusion Bonding of FPS Heat Pipes to Core, Phase I (<https://techport.nasa.gov/image/128472>)



Final Summary Chart Image

Liquid Interface Diffusion Bonding of FPS Heat Pipes to Core, Phase I Project Image (<https://techport.nasa.gov/image/128872>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

The Peregrine Falcon Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

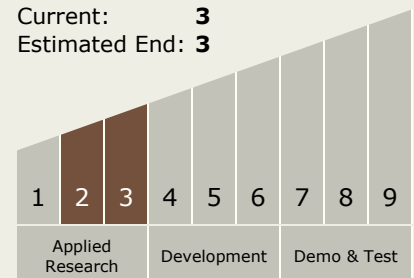
Carlos Torrez

Principal Investigator:

Robert Hardesty

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System